IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-30. (Canceled)

31. (New) A method for estimating the pose of an articulated figure, comprising the steps of:

obtaining dense range data which describes the distance of points on the figure from a reference;

C1

constructing a model using the dense range data;

producing a hypothesis for the pose of the articulated figure, wherein the hypothesis is applied to the model to generate an expected input;

comparing the expected input to the dense range data resulting in an error value and, based on the error value, producing an updated hypothesis and a set of output parameters; and

processing the dense range data to estimate the pose of the articulated figure from the set of output parameters.

32. (New) A method as recited in claim 31 wherein the dense range data is processed in accordance with a set of depth constraints to estimate the pose.

33. (New) A method as recited in claim 31 wherein the dense range data is processed in accordance with a set of depth constraints that are linear.

34. (New) A method as recited in claim 31 further including obtaining brightness data from an image of the articulated figure, and processing the brightness data in accordance with a set of linear brightness constraints to estimate the pose.

35. (New) A method as recited in claim 31 wherein the dense range data is processed in accordance with a set of depth constraints that are represented by means of twist mathematics.

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Cont

36. (New) A method as recited in claim 31 wherein the dense range data is compared with an estimate of pose to produce the error value, and the estimate is recursively revised to minimize the error.

37. (New) A method as recited in claim 31 further including the steps of obtaining brightness data from an image of the figure, and processing the brightness data in accordance with a set of brightness constraints to estimate the pose.

38. (New) A method as recited in claim 31 wherein the focus of expansion is shifted by an integer value.

39. (New) A method as recited in claim 31 wherein shifting the focus of expansion improves an accuracy of a constraint.

40. (New) A method as recited in claim 31 wherein shifting the focus of expansion non-iteratively improves an accuracy of a constraint.

41. (New) A method for estimating a pose of an object, comprising the steps of:

obtaining dense range data which describes the distance of points on the object from a reference;

constructing a model using the dense range data;

producing a hypothesis for the pose of the object, wherein the hypothesis is applied to the model to generate an expected input;

C1 cont'd

comparing the expected input to the dense range data resulting in an error value and, based on the error value, producing an updated hypothesis and a set of output parameters; and

processing the dense range data in accordance with a set of linear depth constraints to estimate the pose of the object based on the output parameters.

42. (New) A method as recited in claim 41 wherein the object is articulated.

43. (New) A method as recited in claim 41 wherein the object is articulated and the depth constraints are represented by means of twist mathematics.

44. (New) A method as recited in claim 41 wherein further including:

mapping original parameters which describe rotation and translation of the object to a set of linear parameters;

solving for the set of linear depth constraints; and

re-mapping back to the original parameters to provide a pose estimate.

45. (New) A method as recited in claim 41 wherein further including:

obtaining brightness data from an image of the object; and

processing the brightness data in accordance with a set of linear brightness constraints to estimate the pose.

46. (New) A method as recited in claim 41, further including:

C1 estimating an orientation position and a translational position of the object; and

cont decoupling an estimate of the orientation position from the translational position.

47. (New) A method as recited in claim 41, wherein the reference comprises a location on the object, and the pose is estimated from a position of the points on the object relative to the location.

48. (New) A method as recited in claim 41, further including:

estimating the pose of the object for each image in a sequence of images; and

selecting a rigid translation value for each point on the object from one image to the next.

49. (New) A method as recited in claim 48, wherein the rigid translation value is an integer value.

50. (New) The method of claim 48, wherein the rigid translation value is different for each point on the object.

51. (New) A method for estimating the pose of an object appearing in a sequence of video images, comprising the steps of:

obtaining dense brightness data for pixels in each of the video images;

obtaining dense range data for pixels in each of the video images;

determining an initial pose for the object in one of the video images; and

constructing a model using the dense range data and the dense brightness data;

producing a hypothesis for the pose of the object, wherein the hypothesis is applied to the model to generate an expected input;

C1 cont'd

comparing the expected input to the dense range data and the dense brightness data resulting in an error value and, based on the error value, producing an updated hypothesis and a set of output parameters; and

processing the dense range data in accordance with a set of linear depth constraints to estimate a change in at least one of a translational position or a rotational orientation of the object for successive images, on the basis of the dense range data, the dense brightness data, and the output parameters.

52. (New) The method of claim 51, wherein the object is an articulated object.

53. (New) The method of claim 51, wherein the estimates are obtained by means of linear constraint equations that are applied to the dense range data and the dense brightness data.